



# Biomass Program

## Integrated Biorefineries R&D

### Advanced Biorefining of Distiller's Grain and Corn Stover Blends

Fuel ethanol can be produced via the dry milling process, which converts corn grain to ethanol. The co-product, distiller's grain (DG), is sold as a low-cost, high-protein feed source for livestock.

Researchers are working to develop a novel biomass-derived process technology that utilizes advanced biorefined distiller's grain and corn stover blends and achieves significantly higher ethanol yields while maintaining the protein feed value.

The project will demonstrate at bench and pilot scale a viable pretreatment process for distiller's grains and corn stover to convert residual starch, cellulose, and hemicellulose to ethanol and high-protein feed.

#### R&D Pathway

The project will be carried out in two phases. Phase I will focus on converting residual starch in order to increase alcohol yields and improve feed product quality. Phase II will deal with the conversion of distiller's grains and corn stover to a substrate suitable for alcohol production.

The bench scale phases of the project will be performed at the

National Renewable Energy Laboratory and Novozymes facilities. Final integration and pilot scale testing will occur at the Abengoa Bioenergy R&D facility and Abengoa Bioenergy Corporation's York, Nebraska facility (55 million gallon ethanol per year).

Abengoa Bioenergy R&D and SunOpta will jointly develop a biomass fractionation technology for the production of ethanol and high-value co-products. This technology can be readily integrated into existing dry-grind ethanol plants.



**Pilot scale testing will be performed at the Abengoa Bioenergy R&D facility. Photo courtesy of Abengoa Bioenergy R&D, Inc.**

#### Benefits

- Higher ethanol yields
- Reduced petroleum use through increased production of ethanol
- High-value co-products

#### Applications

This project will enable an improved ethanol production process without undercutting the benefits of high-protein feed co-products.

#### Project Participants

**Abengoa Bioenergy Corporation**  
**National Renewable Energy Laboratory**  
**Novozymes, N.A.**  
**SunOpta, Inc.**  
**Auburn University**

#### Project Period

**FY 2003 – FY 2008**

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**Visit the Web site for the Office of the Biomass Program (OBP) at**  
[www.eere.energy.gov/biomass.html](http://www.eere.energy.gov/biomass.html)

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